



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/520,109

01/03/2005

Norbert Breuer

R.303095

9548

2119 7590 05/21/2007
RONALD E. GREIGG
GREIGG & GREIGG P.L.L.C.
1423 POWHATAN STREET, UNIT ONE
ALEXANDRIA, VA 22314

EXAMINER

TRAN, DIEM T

ART UNIT

PAPER NUMBER

3748

MAIL DATE

DELIVERY MODE

05/21/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/520,109

Applicant(s)

BREUER ET AL.

Examiner

Diem Tran

Art Unit

3748

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-22, 24-29 and 31-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-22, 24-29, 31-41 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This office action is in response to the amendment filed on 12/20/06. In this amendment, claims 20, 21, 24, 25, 27, 31, 33, 36, 37, 38 have been amended, claims 1-19, 23, 30 have been canceled and 40, 41 have been added. Overall, claims 20-22, 24-29, 31-41 are pending in this application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 20-22, 31-39, 41 are rejected under 35 U.S.C. 102(b) as being anticipated by Birckigt et al. (WO 02/42615) (see equivalence US Patent 6,938,409) in view of Caren et al. (US Patent 6,321,531).

Regarding claims 20, 21, 39, Birckigt discloses a method for purifying the exhaust gas stream in the exhaust gas line of an internal combustion engine, of particles such as soot, the exhaust gas stream being enriched with electric gas discharge, the method comprising the steps of effecting a continuous enrichment of the exhaust gas stream with electric gas discharge such that particles that are present are to a great extent oxidized even during the flow through the exhaust gas line, measuring at least one of the temperature of the exhaust gas and the particle content of the exhaust gas downstream of the enriching, and controlling the concentration of the electric gas discharge essentially as a function of at least one of the temperature and the particle

Art Unit: 3748

content of the exhaust gas, such that the remaining particle content of the exhaust gas stream does not exceed a predetermined limit value (see col. 4, lines 50-67); however, fails to disclose ozone is used instead of electric gas discharge. Caren teaches that ozone is generated in a reaction chamber (23) outside the exhaust gas stream and is supplied to the exhaust gas (see Figure 2).

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized the teaching of Caren in the Birckigt apparatus, since the use thereof would have provided a highly reactive gas species ozone necessary to purify harmful emissions in an exhaust gas stream.

Regarding claim 22, Caren further teaches that ozone is generated in a reaction chamber (23) outside the exhaust gas stream and is supplied to the exhaust gas (see Figure 2).

Regarding claim 36, Caren further teaches that the internal combustion engine is a diesel engine and the rinsing with the gas enriched with ozone is effected during preglow phase of the diesel engine (i.e. before the engine is started) (see col. 15, lines 28-34).

Regarding claim 31, Caren further teaches that the gas stream is introduced into the exhaust gas line upstream of an oxidizing catalytic converter (13) whereby at least the oxidizing catalytic converter is rinsed with the ozone- enriched gas before the engine is started (see col. 15, lines 42-49, col. 16, lines 5-13).

Regarding claim 32, Caren further teaches that controlling the combustion in the engine immediately after the engine is started, such that the exhaust gases still contain combustible hydrocarbons (see col. 22, lines 4-8).

Regarding claims 33-35, Caren further teaches that effecting an enrichment, in particular a depressive enrichment, of the exhaust gas stream with ozone generated by the ozone source until the operating temperature of the oxidizing catalytic converter is reached (see col. 15, lines 18-24, 28-49).

Regarding claims 36-38, Caren further teaches that the internal combustion engine is a diesel engine and the rinsing with the gas enriched with ozone is effected during preglow phase of the diesel engine (i.e. before the engine is started) (see col. 15, lines 28-34).

Regarding claim 41, Caren further discloses a gas stream enriched with ozone is generated in an ozone source, and rinsing the exhaust gas line at least partially with the gas enriched with ozone before the engine is started (see col. 15, lines 28-34).

Claims 24-29, 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Birckigt et al. (WO 02/42615) (see equivalence US Patent 6,938,409) in view of Caren et al. (US Patent 6,321,531) as applied to claim 20 above, and further in view of Rohde et al. (US Patent 3,771,921).

Regarding claim 40, the modified Birckigt method discloses all the claimed limitations as discussed in claim 20 above, however, fails to disclose introducing the ozone into the exhaust gas line in the region of the particulate filter so that the particle filter can be regenerated after the engine has been shut off. Rohde teaches introducing the ozone into the exhaust gas line in the region of a catalytic converter after engine has been shut off (see col. 5, lines 36-51).

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized the teaching of Rohde in the modified Birckigt

method, since the use thereof would have been conventional in the art to improve the efficiency of the emission control system.

Regarding claim 24, Birckigt further discloses increasing the ozone concentration on or in the particle filter until the self-ignition of the deposited particles (see col. 4, lines 50-60).

Regarding claims 25, 26, Caren further teaches using a blower to generate an ozone-enriched gas flow through the catalyst device (see col. 22, lines 4-12).

Regarding claims 27-29, Birckigt further discloses regulating the ozone delivery on the basis of the temperature of the particle filter (see col. 4, lines 50-60).

Response to Arguments

Applicant's arguments filed on 12/20/06 have been considered but they are moot in view of a new ground(s) of rejection.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

Art Unit: 3748

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

Any inquiry concerning this communication from the examiner should be directed to Examiner Diem Tran whose telephone number is (571) 272-4866. The examiner can normally be reached on Monday -Friday from 8:00 a.m.- 5:30p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion, can be reached on (571) 272-4859. The fax number for this group is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 800-786-9199 (toll-free).



Diem Tran
Patent Examiner

DT



THOMAS DENION
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700